.								_			1		
2							1	<i>}</i> r	1	.>.	*		1
							100	w_{-}	A	71	M		r /
	2.6	auto Aura	a marini	A 18	d get	eria de primita y	Secretary	UR.	11	* * * * A	t	a Tab	/
	V	2.5	3 2	10	4 1							100	

			- 20 mg/s	
_		Solutions	Marks	Remarks
1.		$\frac{\pi}{6}$ (radian) $\sqrt{90.67}$ $\sqrt{1-100}$ $\sqrt{1-1000}$ \sqrt	1A	
	(p)	$x = 150^{\circ} \left(\frac{5\pi}{6}, 2.62\right)$	E .	
	(c)	cos A	<u>1A</u>	
2.	(a)	p + q	1A	
	(b)	-2	1 A	
	(c)	√3 - √2 (¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬	1A	
- 3.	(a)	$y \geq \frac{1}{2}$	1 A)	Withhold 1 mk if
		2x - y ≥ 2	1A /	'=' omitted
		$3x + 5y \le 30$	1A)	
	(b)	16	1A 4	
4.	(a)	(i) $x^2 - 2x = x(x - 2)$	1 A	x2.2x20 (b)
		(ii) $x^2 - 6x + 8 = (x - 2)(x - 4)$	1 A	Y(Y-2)20
	(b)	$\frac{1}{x^2-2x}+\frac{1}{x^2-6x+8}=\frac{1}{x(x-2)}+\frac{1}{(x-2)(x-4)}$		
		$= \frac{(x-4)+x}{x(x-2)(x-4)}$	1M ?	Burgarit ca
		$= \frac{(x-4)+x}{x(x-2)(x-4)}$ $= \frac{2x-4}{x(x-2)(x-4)}$ $= \frac{2x-4}{x(x-2)(x-4)}$ Circ A	1 A	
		$= \frac{2}{x(x-4)} \qquad \left(=\frac{2}{x^2-4x}\right)$	1 A	
			5	
5.	(a)	Slope of $L_2 = \frac{1}{2}$	1 A	
		Slope of $L_1 = -2$		
		Equation of $L_1: y-5 = -2(x-10)$	1M	Pt-slope form
		i.e. $2x + y - 25 = 0$ (or $y = \frac{1}{2}$)	1A	-
	(b)	Solving $\begin{cases} x - 2y + 5 = 0 \\ 4x + 2y - 50 = 0 \end{cases}$		
		5x - 45 = 0	1M	Eliminating 1 unknown
		x = 9 (or y = 7)	1A	
		\therefore L_1 and L_2 meet at (9, 7)	<u>1A</u> 6	Accept $x = 9$, $y = 7$
			,	i

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Solutions	Marks	Remarks
For distinct real roots $\Delta = (2k)^2 - 4(k+6) > 0$	2M+1A	1A for $(2k)^2 - 4(k+6)$ 2M for $\Delta > 0$
4R - 4R - 24 / 0	1A	$(\Delta \ge 0, 1M \text{ only})$ For $(k+2)(k-3)$
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2A	For ',','='
$\therefore k < -2 \text{ or } k > 3$	ν	withhold 1 mk
光传传点,可象	(6) <u>-6</u>	each finant, to
7. (a) $\angle AOB = \frac{360^{\circ}}{5} = 72^{\circ} \left(= \frac{2\pi}{5} \approx 1.26 \text{ radians} \right)$	1A	7
Area of $\triangle OAB = \frac{1}{2}(10)(10)\sin 72^{\circ}$	1M	
= 47.6 (47.5528)	1A	Any figure roundable to 47.6
(b) Area of sector $OAB = \frac{1}{5} \cdot \pi 10^2$	1A	
$= 20\pi \ (62.83)$		
Area of shaded part = 20π - 47.55	1M	
= 15.3 (15.2790) = 15.3 (15.2790)	1 <u>A</u> 6	Accept 15.2 ~ 15.3
8. (a) Total score of the team = $70(m+n)$	1A	
(b) Total score is also equal to $75m + 62n$.	1A	
75m + 62n = 70(m + n)	1M	
5m = 8n	1A	
$m: n=8:5\left(-\frac{3}{4}\right)$		
(c) The number of men = $39 \times \frac{8}{8+5}$	1M	
= 24	1 <u>A</u> 6	:
8n=11.75		
B C D		

Solutions 9. (a) (i) Area of $OAPB = a \times b$ $= a(2a^2 - 4a + 3)$ $= 2a^3 - 4a^2 + 3a$ (ii) For $OAPB$ to be a square, $a = b \propto ck^2 c k$ $a = 2a^2 - 4a + 3$	Marks 1A 1A	Remarks
$= a(2a^{2} - 4a + 3)$ $= 2a^{3} - 4a^{2} + 3a$ (ii) For OAPB to be a square, $a = b - \gamma$ Checks		
$= 2a^3 - 4a^2 + 3a$ (ii) For OAPB to be a square, $a = b \sim ck \approx 15$	1A	
(ii) For OAPB to be a square, $a = b $ $\gamma \in \mathcal{E} = \mathcal{E}$		j
$a = 2a^2 - 4a + 3$	1M	Equating adjacent sides
4 24 3		
$2a^2 - 5a + 3 = 0$	1A	
(2a - 3) (a - 1) = 0		
$\therefore a = \frac{3}{2} \text{ or } 1$	<u>1A+1A</u> 6	室到69月三线。
(b) (i) If the area of OAPB = $\frac{3}{2}$,		
$2a^3 - 4a^2 + 3a = \frac{3}{2}$		
$\therefore 4a^3 - 8a^2 + 6a - 3 = 0 \dots (*)$	1A	
(ii) Let $f(a) = 4a^3 - 8a^2 + 6a - 3$		f(1.2) ·f(1.5) < p = 5.
f(1.2) < 0 = -0.408 and $f(1.3) > 0 = 0.068$	17.3.	Correct signs only
: (*) has a root lying between 1.2 and 1.3	**	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
Interval Mid-value a f(a)		
1.2 < a < 1.3 1.25 (-0.1875)	1M+1	
1.25 < a < 1.3 1.275 - (-0.0643)		testing sign at mid-value 🕏 🐹 -
$1.275 < a < 1.3 \qquad 1.2875 \binom{1.288}{etc} + (+0.0007)$	1M	Choosing correct interval
1.275 < a < 1.2875 1.28125 - (-0.0321)	1 1	
1.28125 < a < 1.2875 1.284375 - (-0.01578	3∮	
1.284375 < a < 1.2875		
1.28593 7 5 < a < 1.2875		
:. $a = 1.29$ (corr. to 2 d.p.)	_1A_	Check last interval, a ≈
$y = 2x^2 - 4x + 3$ $B(0,b)$	6	1.2874
92-CE-Maths. $O A(a,0)$	1	P.4
Company of the control of the contro		

		KESIKIL IEU MAD	l	Remarks
		Solutions	Marks	Remains
10. (a)	The p	robabilities that a car leaving P will		
	(i)	pass through $B = 1 - \frac{2}{5} = \frac{3}{5}$ (= 0.6) (P ₁)	1A	
	(ii)	not arrive at $T = 1 - \frac{4}{7} = \frac{3}{7}$ (= 0.429)	1 A	$\frac{1}{7} + \frac{2}{7}$
	(iii)	arrive at R through Tunnel B = $\frac{3}{5} \times \frac{1}{7}$	1M	$\frac{1}{7} + \frac{2}{7}$ $P_1 \times \frac{1}{7}$
		$= \frac{3}{35} (= \ 0.0857)$	1 A	· 2 12 2 1
	(iv)	pass through Tunnel A but not arrive at R		
		$= \frac{2}{5} \times \left(1 - \frac{1}{7}\right)$	1A	$\frac{2}{5}\times\frac{2}{7}+\frac{2}{5}\times\frac{4}{7}$
_		$= \frac{12}{35} (= 0.343)$	<u>1A</u> _6_	
(b)	(i)	The probability that the first one will		·
		arrive at R and the second one at S		
		$S = \frac{1}{7} \times \frac{2}{7} = \frac{2}{49} (= 0.0408) (P_2)$	1A 7	Award 1A if $\frac{2}{49}$ given as answer
		The probability that one of them will	1 (given as answer
		arrive at R and the other one at S	}	
		$S = 2 \times \frac{1}{7} \times \frac{2}{7}$	1M	P ₂ x 2
		$= \frac{4}{49} (= 0.0816)$	1A J	n 2 141
	(ii)	The probability that both cars will arrive at		
		s with the first one through Tunnel A and the		
^	•	second one through Tunnel B		
		$= \frac{2}{5} \times \frac{2}{7} \times \frac{3}{5} \times \frac{2}{7} = \frac{24}{1225} (0.0196) (P_3)$	1A }	Award 1A if $\frac{24}{1225}$ given as answer
		The required probability = $2 \times \frac{24}{1225}$	1M	P ₃ x 2
		$= \frac{48}{1225} (0.0392)$	1A)	
		2 7 R	6	•
		Tunnel A S	•	
. j		Tunnel B &		

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		Solutions		Marks	Remarks				
11.	(a)	Proof :							
	. ,	$\angle f_1 = \boxed{\angle a_1} (\angle DAY, etc.)$	(Corr. ∠s, AD//FE .)	1 A	Accept a_1 , etc.				
		But $\angle a_1 = \angle e_3$	(Ext. ∠ , cyclic quad.)	1 A	任-孝舜 称之意,珞				
		$\therefore \angle f_1 = \angle e_3$							
		∴ EY = FY	(Sides opp. equal Zs)	1A					
		i.e. ΔEFY is isosceles	·	3					
	(þ)	Proof :							
		BCD = AFE	(Given)						
_		$\therefore \angle a_2 = \boxed{ \ \ \angle d \ }$	(Equal arcs subtend equal						
		∴ BA // DE	∠sat circumference) (Alt. ∠sequal)	1A 1					
	(c)	Proof:							
•		$\angle a_1 = \boxed{\angle f_1}$	(Corr ∠s, AD//FE)	1 A					
		But $\angle f_1 = \angle b$	(Ext. ∠ , cyclic quad.)	1 A					
		and $lb = le_1$	(Alt. $\angle s$, $BA // DE$)						
		$\therefore \angle a_1 = \boxed{ \angle e_1 }$		1 A					
		\therefore A, X, E, Y are co	ncyclic.						
		•	(Ext. \(\text{equals int.opp. } \(\)						
$\overline{}$	(d)	Solution:		些	Note that				
				1A	$a_1 = a_2 = b = d = f_1$				
		Δy = 86°	A A	7 1M+1A	$a_1 = a_2 = b = d = f_1$ $a_1 = a_2 = b = d = f_1$ $a_1 = a_2 = b$ $a_1 = a_2 = b$ $a_1 = a_2 = b = d = f_1$				
		Δx = 94°		1M+1A	x = 180° - y				
		Boby	f_2 F f_3	5_5_	or $x = b + a_2$ or $x = e_1 + d$				
		C	x (4 e ₃ u) y y		宝文写信 u-1				
			E						
		D	E						

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• •	Solutions	Marks	Remarks
12. (a)	(i) Capacity of funnel = $\frac{1}{3}\pi (9)^2 \times 20$	1A	
	$= 540\pi \text{ cm}^3$	1A	
•	(ii) Vol. of water : total vol. of oil and water :	cap of f	unnel
	$= 10^3 : 15^3 : 20^3$	1A+1A	1A for 10:15:20
	$= 2^3 : 3^3 : 4^3 (= 8:27:64)$	1A (A 10 10 13 20
	vol. of water : vol. of oil : capacity of f	unnel	or election
	= 8:19:64	1A 6	·
(b)	Let the depth of water be h cm.		
	Capacity of bottom part = $\frac{2}{3}\pi \cdot 3^3$	1A	
	$= 18\pi \text{ (cm}^3)$		
- 67.	$\frac{1}{540\pi} \times \frac{8}{64} = \pi \times 3^2 (h - 3) + 18\pi$	1M	Equating vol. of water in two forms
	$\therefore \text{depth} = 8 \frac{1}{2} \text{ cm}$	_1A_	
	•	3	
(c)			
	\therefore depth of water : depth of oil = 2 : $\sqrt[3]{19}$	2M	
	depth of oil = $10 \times \frac{\sqrt[3]{19}}{2} = 5\sqrt[3]{19}$ cm (13.3 cm)	1 <u>A</u>	
	9 cm 5 cm 5 cm 15 cm 15 cm 15 cm Figure 6a Figure 6b		
÷ Š	•		

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Solutions Marks Remarks						
Alt	ernatively: $\frac{1}{3}\pi(4.5)^{2}(10)$					
2. (a)	(ii) Vol. of water = $\frac{1}{3}\pi \left(\mathbf{q} \times \frac{10}{20} \right)^2 \times 10 = 67.5\pi \text{ (cm}^3)$	1A \				
	Vol. of water + oil = $\frac{1}{3}\pi^{\frac{20}{15}} (\frac{15}{20})^2 \times 15 = 227.8$	125π (cm ³) 1A			
	∴ vol. of water : vol. of oil cap. of funnel					
	$= 67.5\pi : 227.8125\pi : 540\pi$					
	= 8 : 27 : 64	1A 🖔 🏃	養養(5)			
	Vol. of water : vol. of oil : cap. of funnel					
	= 8 : 19 : 64	1A				
(c)	Let the depth of the oil be h cm, the radius of the					
	oil surface be r cm.					
_	Then $\frac{r}{h} = \frac{9}{20}$	•.				
	Volume of oil remaining = $\frac{1}{3}\pi r^2 h$					
	$= \frac{1}{3}\pi \left(\frac{9h}{20}\right)^2 h \ (\text{cm}^3)$	1M	Sub r			
	But volume of oil = $540\pi \times \frac{19}{64}$ (cm ³)					
85 (C	$\begin{cases} \xi \sqrt{\frac{5}{15}} \sqrt{\frac{6}{10}} \\ 540\pi \times \frac{19}{64} = \frac{1}{3}\pi \left(\frac{9h}{20}\right)^2 h \end{cases}$	1M				
[6	$\frac{135 \times 19}{16} = \frac{27}{400} h^3$					
	Depth = $5 \times \sqrt[3]{19}$ cm $\left(13.54 \text{ cm}\right)$.	1A				
	540 (184) = (20) 640T1					
	Exort I					

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	Solutions	Marks	Remarks
13. (a)	C = (9,7) (or x = 9, y = 7)	1A	8.7 (pp.).
	Radius = $\sqrt{9^2 + 7^2 - 105} = 5$	1 <u>A</u>	
. (b)	Putting $y = mx$,		
. (~)	$x^2 + (mx)^2 - 18x - 14(mx) + 105 = 0$	1A	
	$(1 + m^2) x^2 - (18 + 14m) x + 105 = 0$		
	As x_1 , x_2 are the roots, $x_1x_2 = \frac{105}{1 + m^2}$		Only awarded if above correct Note of the right
(c)	$OA = \sqrt{{x_1}^2 + {y_1}^2}$	1A 4	eption ().
	$= \sqrt{x_1^2 + (mx_1)^2}$	1A (
	$(=(\sqrt{1+m^2)}x_1)$		2 + 1
	$OB = \sqrt{x_2^2 + y_2^2} = \sqrt{x_2^2 + (mx_2)^2} \left(= (\sqrt{1 + m^2}) x_2^2 \right)$	1A)	
	$\therefore OA \times OB = (1 + m^2) x_1 x_2$		
	= 105	1 <u>A</u>	
(d)	Let $M = mid-point of AB$. If $CM = 3$,		
	$AM = \sqrt{5^2 - 3^2} (= 4)$	1m (程序就,但用得《是智》
	$\therefore AB = 2 \times 4 = 8$	1A	1
	Let $OA = x$, then	" ORX"	OR OR
	x(x+8) = 105	1M 7	
	$x^2 + 8x - 105 = 0$		$= \sqrt{9^2 + 7^2 - 3^2} \text{ 1M}$
	(x-7)(x+15)=0		$= 11$ $\therefore OA = OM - AM$
	$\therefore x = 7 (as \ x \neq -15)$	1 <u>A</u>	= 11 - 4 = 7 1A
	Q: y = mx		
	$A(x_1, y_1)$ $x^2 + y^2 - 18x - 14y + 105 = 0$		
7	Figure 7		
	1	i	I

·	•	RESTRICTED 内部文件						
		Solutions	Marks	Remarks				
14.	(a)	The common ratio = $\frac{b}{a}$	1 A	.				
		The sum to n terms = $\frac{a^{n} \left[1 - \left(\frac{b}{a}\right)^{n}\right]}{1 - \frac{b}{a}}$	1M	or $\frac{a^n - \frac{b}{a}(ab^{n-1})}{1 - \frac{b}{a}}$				
		$=\frac{a(a^n-b^n)}{a-b} (=\frac{a^{n+1}-ab^n}{a-b})$	_1A 3					
	(b)	(i) The balance at the end of						
		(1) the 1st year = $$1.08P$	1A	= (1 + 8%)P				
		(2) the 2nd year = $$(1.08^2P + 1.1 \times 1.08P)$	1A+1A	= 1.1664P + 1.188P = 2.3544P				
		(3) the 3rd year = $\$(1.08^3P + 1.1 \times 1.08^2P + 1$	$.1^2 \times 1.0$ $1A$	8 P) = 3.849552P				
		(ii) At the end of the nth year, the balance						
		$= \$P[1.08^n + 1.08^{n-1} \times 1.1 + 1.08^{n-2} \times 1.1^2 + \dots + 1$	$08^2 \times 1$.	$n^{-2} + 1.08 \times 1.1^{n-1}$				
		$= \$P \frac{1.08(1.08^n - 1.1^n)}{1.08 - 1.1}$	2 A					
		$= $54P(1.1^n - 1.08^n)$	<u> </u>					
	(c)	In n years' time, the flat is						
		worth \$1080000 x 1.15 ⁿ	1A					
		Put $P = 20000$, the amount in the man's account						
		$= \$1080000(1.1^n - 1.08^n)$						
		< \$1080000 x 1.15 ⁿ	1 <u>A</u> 2					
-,		P(1+8%) = 1.08P						
		P 1.1P 1.21p.		. वे .रे				
				(-, 12				
				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				
		(1.08p+1.1p)x(1+8/0)						
		=(1.08p+1.1p)x 1.08						
		= 1.08°p+1.1×1.08×P						

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•	Solutions	Marks	Remarks
15. (a)	$BD = \sqrt{3^2 + 3^2} = 3\sqrt{2} \text{ m} (\sqrt{18} \text{ m})$	1 A	4.24, withhold 1 mk if answers not in surd form
	$ED = \sqrt{BD^2 - BE^2}$		
	$= \sqrt{18 - 4}$		
	$= \sqrt{14} m$	1A	3.74
	$AE = \sqrt{BA^2 - BE^2}$		
	$= \sqrt{9-4}$		
	$=\sqrt{5}$ m	1A 3	2.24
(b)			
($\cos \angle ADE = \frac{3^2 + (\sqrt{14})^2 - (\sqrt{5})^2}{2 \times 3 \times \sqrt{14}} (= 0.8018)$	1M+1A	
	∴ ∠ADE = 36.7°	1A	36.5°~36.8°
	Alternatively:		·
	As $\angle DAE = 90^{\circ}$	1A	Follow through if omitted
	$\tan \angle ADE = \frac{AE}{AD} = \frac{\sqrt{5}}{3}$	1M	
	∴ ∠ADE = 36.7°	1 <u>A</u> 3	36.5°~36.8°
(c)	$\sin \angle BDE = \frac{2}{\sqrt{18}} (= 0.4714)$	1M	or $\tan \angle BDE = \frac{2}{\sqrt{14}}$
	$\therefore \angle BDE = 28.1^{\circ} (28.1255)$	_1A 2	or $\cos \angle BDE = \frac{\sqrt{14}}{\sqrt{18}}$
	D 3m II		
	um "		

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•	Solutions	Marks	Remarks
(d)	Let M be a point on BD such that (or mid-pt of BD,et		Considering AM
	AM $\perp BD$. We have $DM = MB$ as $AB = AD$.	T-4	
	Let N be the mid-point of AC .		
	Then $MN \perp AC$ as $AM = MC$.		
	Similarly $DN \perp AC$.		
	Now $\sin \angle ADE = \frac{AN}{AD}$	٦	See also alt. solution
	\therefore AN = 3sin36.7° m (= 1.7928)	1A	3 sin 36.5°~ 3 sin 36.8°
	$AM = \frac{1}{2}BD = \frac{3}{2}\sqrt{2} \text{ m}$		
	$\sin \angle AMN = \frac{AN}{AM} = \frac{3\sin 36.7^{\circ}}{\frac{3}{2}\sqrt{2}} (= 0.84515)$	1м	Attempt to find
	\therefore $\angle AMN = 57.69 (57.6885)$		∠AMN or ∠AMC
	\therefore $\angle AMC = 2 \times 57.69 = 115^{\circ} (\sim 116^{\circ})$	1A 4	
Alt	ernatively:		
Nov	$v \sin \ell ADE = \frac{AN}{AD}$		
÷	$AC = 2AN = 2 \times 3\sin 36.7^{\circ}$ m (= 3.5858)	1A	
	$T = \frac{1}{2}BD = \frac{3}{2}\sqrt{2} \text{ m}$		
	the cosine formula,		
cos	$\frac{(\frac{3}{2}\sqrt{2})^2 + (\frac{3}{2}\sqrt{2})^2 - (2 \times 3\sin 36.7^\circ)^2}{2(\frac{3}{2}\sqrt{2})(\frac{3}{2}\sqrt{2})}$	1M	Attempt to
~	$2\left(\frac{1}{2}\sqrt{2}\right)\left(\frac{1}{2}\sqrt{2}\right)$		find \(\alpha AMC\)
	= -0.4286		11
	\(\alpha MC = 115\circ (~116\circ) \)	1 A	
i.			

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6.
∴ k<-2 or k>3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2. (a) p+q
                                                                                                    For distinct real roots

\Delta = (2k)^2 - 4(k+6) > 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                 (a) Slope of L_2 = \frac{1}{2}
                                                                                                                                                                                                                                                                                          (b) Solving \begin{cases} x - 2y + 5 = 0 \\ 4x + 2y - 50 = 0 \end{cases}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (a) (1) x^2 - 2x = x(x-2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (a) y \ge \frac{1}{2}
                                  (k+2)(k-3)>0
                                                                4k^2 - 4k - 24 > 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ਉ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (b) 16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (c) /3 - /2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (c) cos A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (b) x = 150^{\circ} (\frac{5\pi}{6}, 2.62)
                                                                                                                                                                                                                                                                                                                                                                           Equation of L_1 : y - 5 = -2(x - 10)
                                                                                                                                                                                                                                                                                                                                        1.e. 2x + y - 25 = 0
                                                                                                                                                                                                                                                                                                                                                                                                             Slope of L_1 = -2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             <u>,</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \frac{x^2-2x}{x^2-6x+8} + \frac{x^2-6x+8}{x^2-6x+8} = \frac{x(x-2)}{x(x-2)} + \frac{1}{(x-2)(x-4)}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (11) x^2 - 6x + 8 = (x - 2)(x - 4)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3x + 5y 4 30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2x - y \ge 2
                                                                                                                                                                            L_1 and L_2 meet at (9, 7)
                                                                                                                                                                                                             x = 9 (or y = 7)
                                                                                                                                                                                                                                                            5x - 45 = 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \frac{2}{x(x-4)} \qquad \left( = \frac{2}{x^2-4x} \right)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \frac{(x-4)+x}{x(x-2)(x-4)}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \frac{2x-4}{x(x-2)(x-4)}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (a) (i)
                                                                                                                                                                                                                                         2a^3 - 4a^2 + 3a = \frac{3}{2}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     75m + 62n = 70(m + n)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5m = 8n
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7. (a) $\angle AOB = \frac{360^{\circ}}{5} = 72^{\circ} \left(= \frac{2\pi}{5} = 1.26 \text{ radians} \right)$ (b) Area of sector $OAB = \frac{1}{5} \cdot \pi \cdot 10^2$ Area of shaded part = $20\pi - 47.55$ Area of $\triangle OAB = \frac{1}{2}(10)(10)\sin 72^{\circ}$ **= 47.6 (47.5528)** $= 20\pi (62.83)$ = 15.3 (15.2790)

1992

1. (a) $\frac{\pi}{6}$ (radian)

(a) Total score of the team = 70(m+n)(b) Total score is also equal to 75m + 62n.

(c) The number of men = $39 \times \frac{8}{8+5}$ **=** 24

(ii) For OAPB to be a square, a = bArea of $OAPB = a \times b$ $= 2a^3 - 4a^2 + 3a$ $= a(2a^2 - 4a + 3)$

 $2a^2 - 5a + 3 = 0$ $a = 2a^2 - 4a + 3$ (2a-3)(a-1)=0 $a = \frac{3}{2} \text{ or } 1$

(b) (i) If the area of $OAPB = \frac{3}{2}$,

 $4a^3 - 8a^2 + 6a - 3 = 0 \dots (*)$

(ii) Let $f(a) = 4a^3 - 8a^2 + 6a - 3$ $f(1.2) < 0 \ (= -0.408)$ and $f(1.3) > 0 \ (= 0.068)$

(*) has a root lying between 1.2 and 1.3